University of Zurich[UZH]

Breast Neoplasm - NCIT:C291

BIO392 Project Presentation

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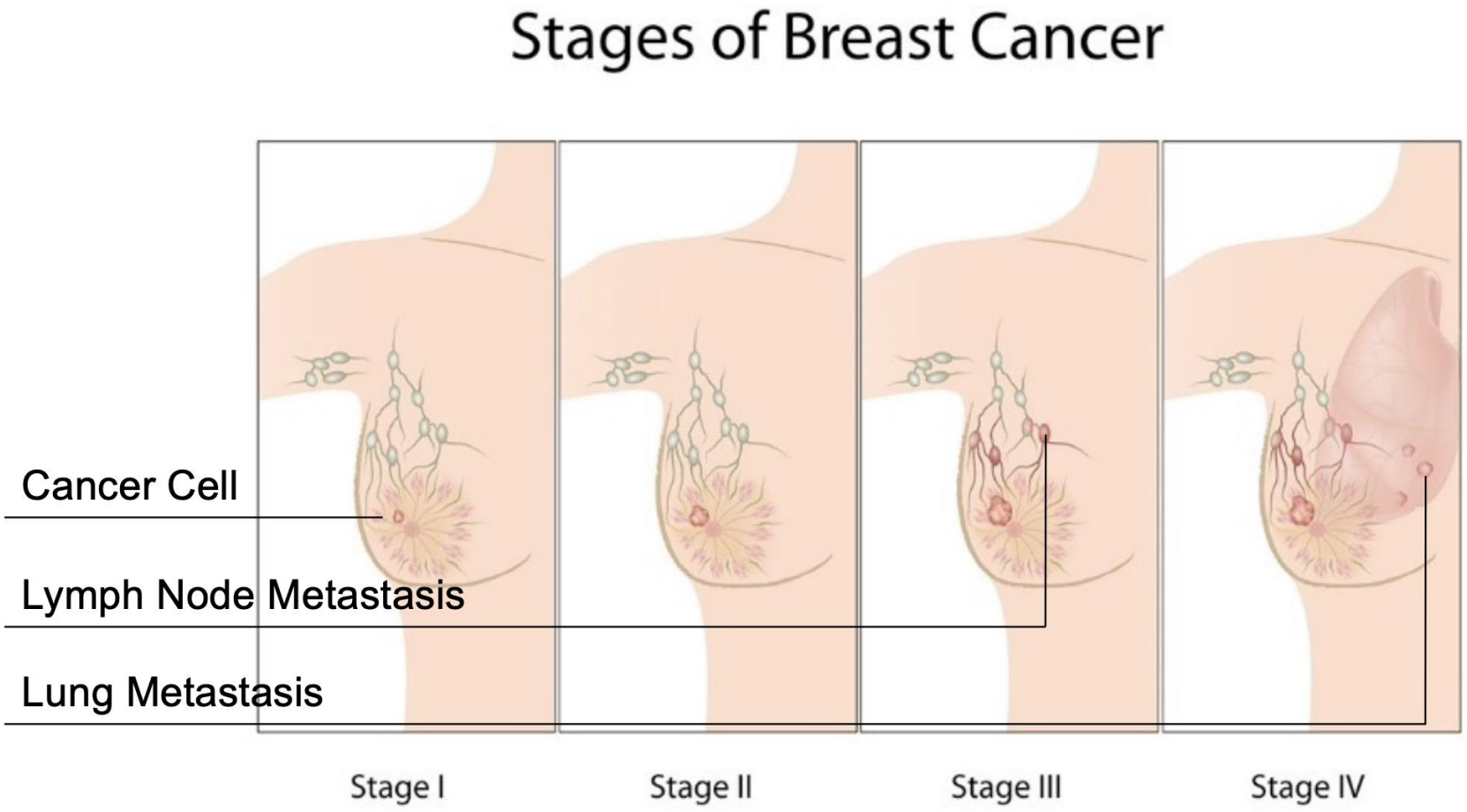
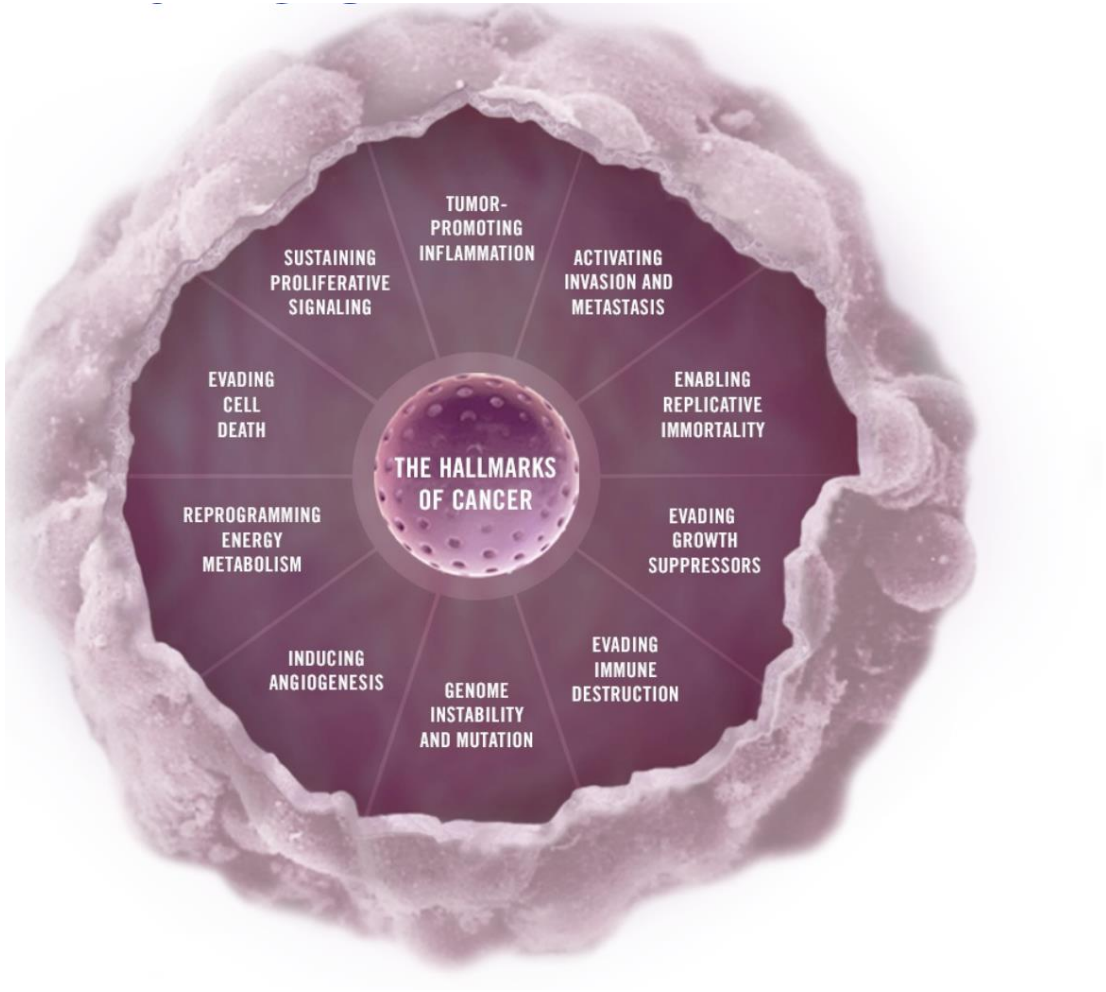
Introduction



- Variants from T1 until T4
- T2 have the most appearances
- Very few data including “N”
- No datas with a “M”

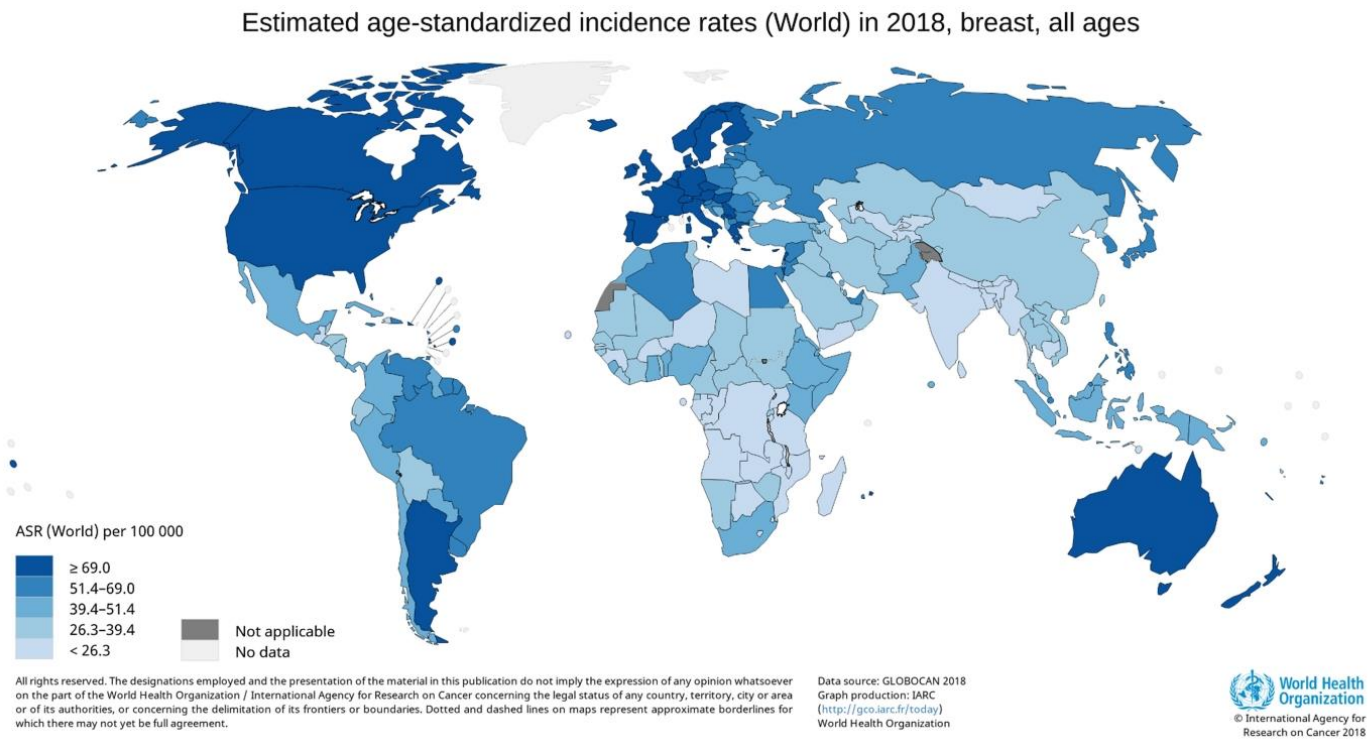
Introduction



1. Genome Instability and Mutation
2. Enabling Replicative Immortality
3. Escaping Immune System
4. Sustained Proliferation
5. Evading Growth Suppressors
6. Angiogenesis
7. Metabolism
8. Inflammation
9. Invasion and Spreading
10. Resistance

Introduction

Breast Cancer Incidence Worldwide*



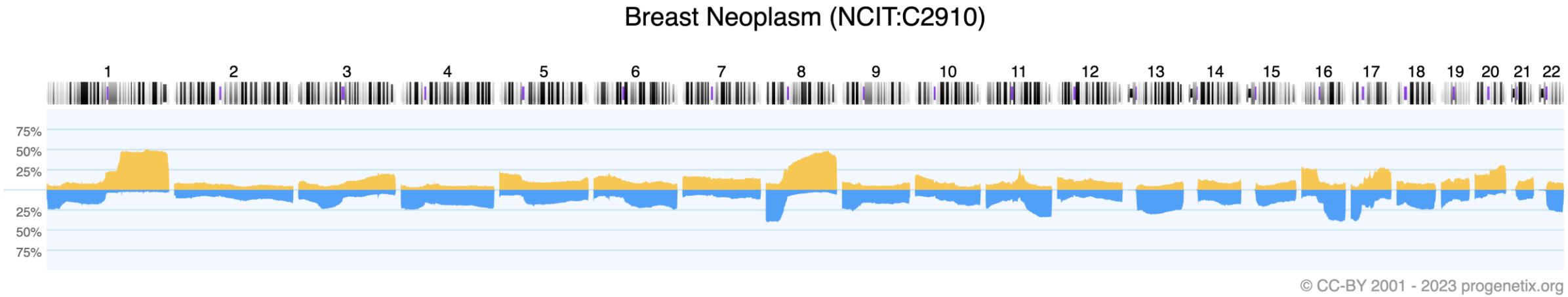
Country	Age-standardised rate (per 100,000 women)
Belgium*	113.2
Australia*	94.5
United Kingdom*	93.6
Denmark*	88.8
United States*	84.9
Canada*	83.8
Singapore*	64.0
South Korea*	59.8
Japan*	57.6
China*	36.1
Hong Kong**	65.5
World*	**46.3**

*Globocan 2018; **Hong Kong Cancer Registry figures published in 2020

Aims

- Investigate the impact of single genes in cancer development
- To illustrate the survival rate
- Age of onset (pre- /post-menopausal)
- Dependency of menopause in breast cancer

Gene Location / CNV



Chromosomal Aberration:

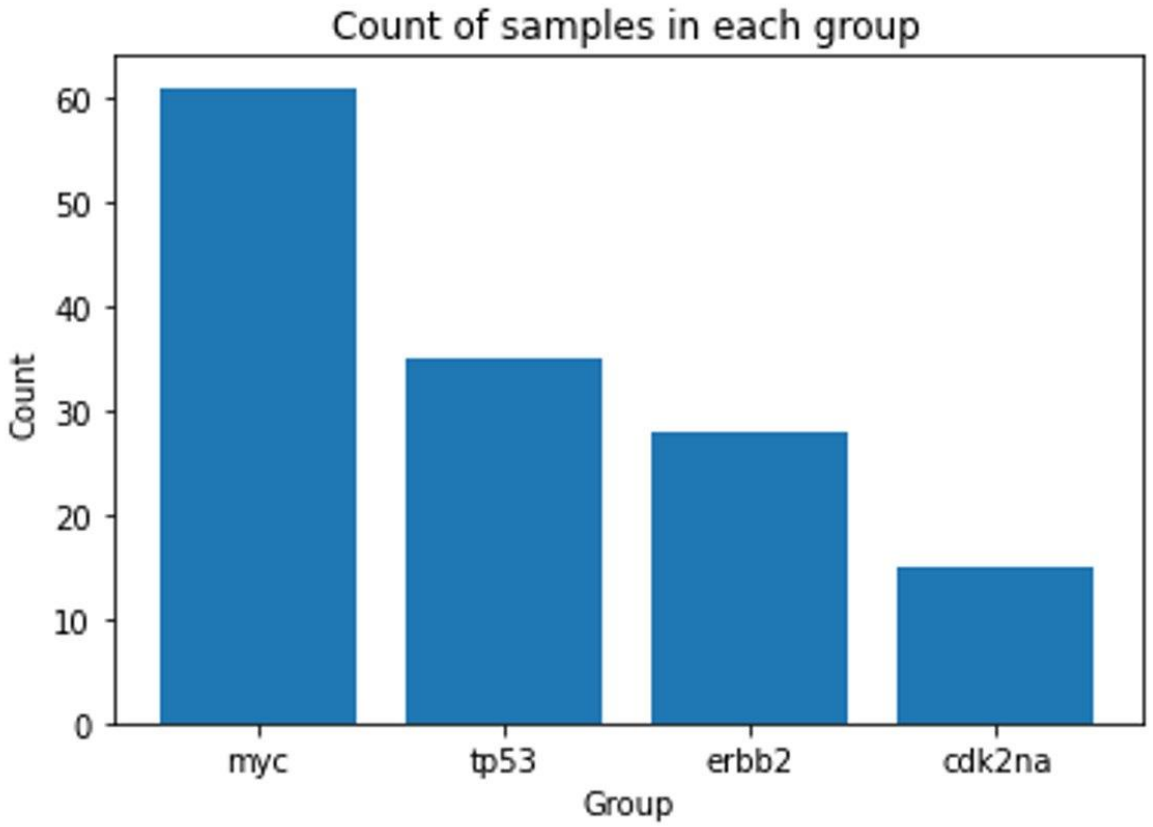
- Cut-off: 25%
- Duplication: 1q, 8q, 16p, 17q, 20q
- Deletion: 8p, 11q, 13q, 16q, 17p, 22q
- Highest peak on chromosome **1q and 8q**

Gene Location:

MYC: Chrom 8q
TP53: Chrom 17p
ERBB2: Chrom 17q
CDK2NA: Chrom 9p

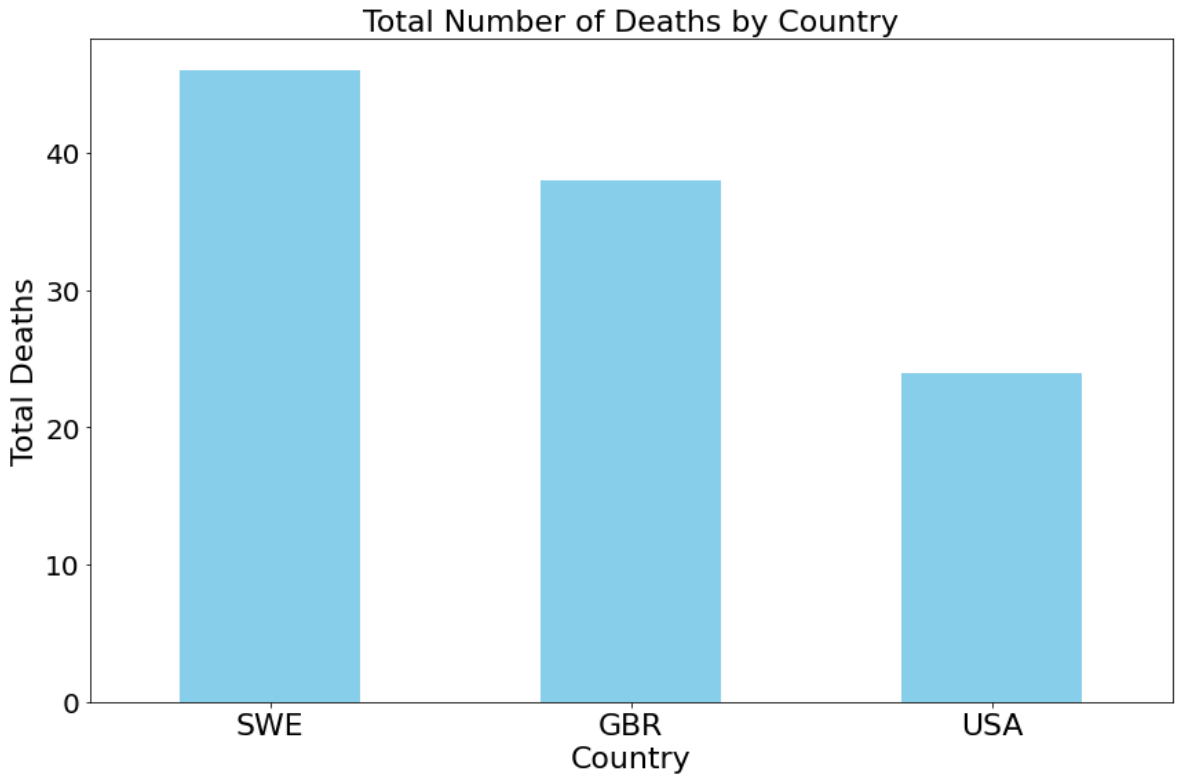
https://progenetix.org

Oncogene & Tumorsuppressor-gene



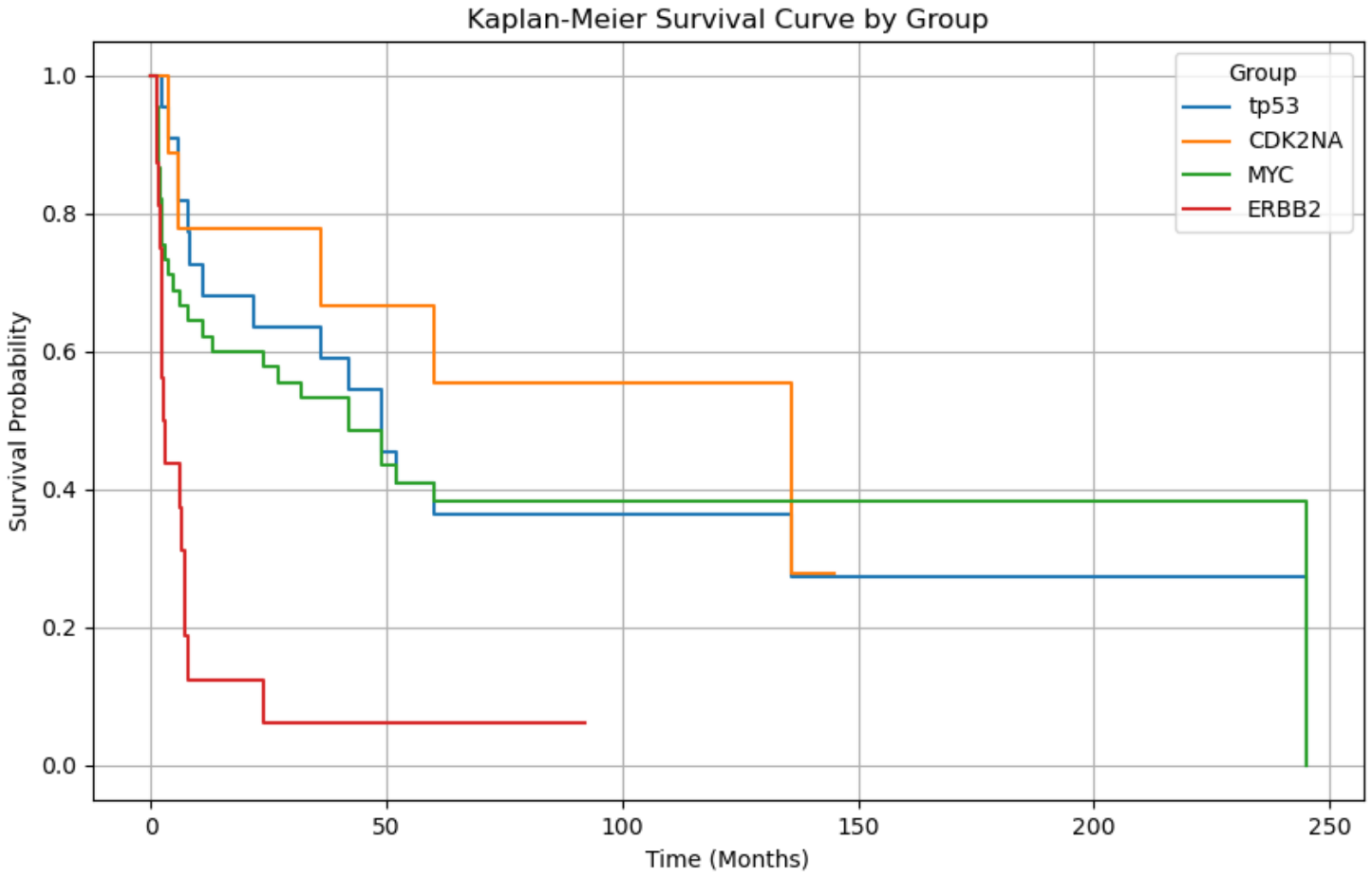
- Highest occurrence of MYC(61) oncogene on all participants
- Total amount of participants 175
- Total Amount of participants with aberration in one of the 4 given genes: 108
- myc 61
- tp53 35
- erbb2 28
- cdk2na 15

Deaths by country



- Total Death: 108
- SWE 46/108 --> 42.6 %
- GBR 38/108 --> 35.2%
- USA 24/108 --> 22.2%

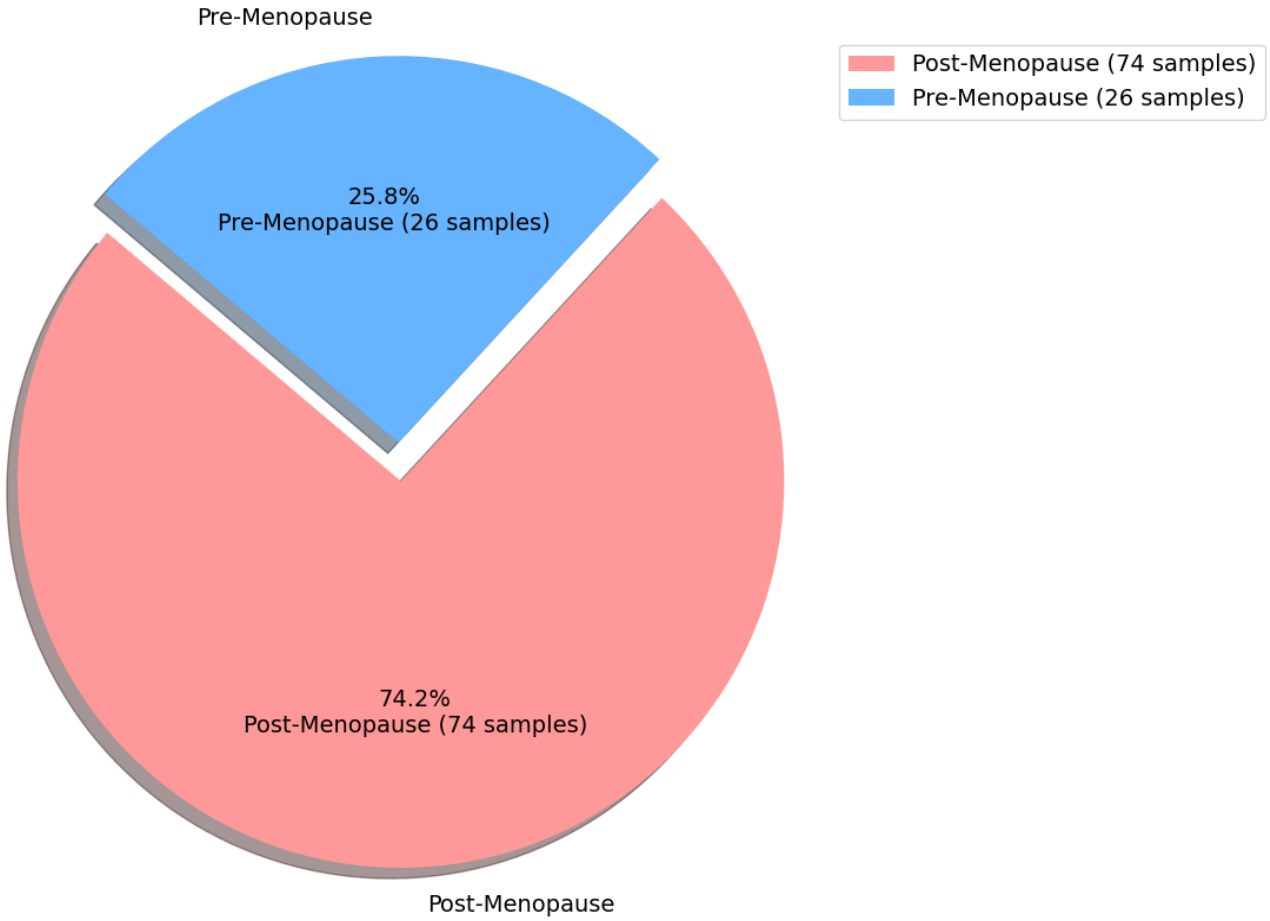
Kaplan Meier Survival



- ERBB2 Mutation most severe impact (Oncogene)
- Receptor tyrosine kinase (Signaling)
- Early stage: The steeper the curve's drop, the faster the events

Influence of menopausal cancer development

- Average menopause age 40-50 years.



Discussion

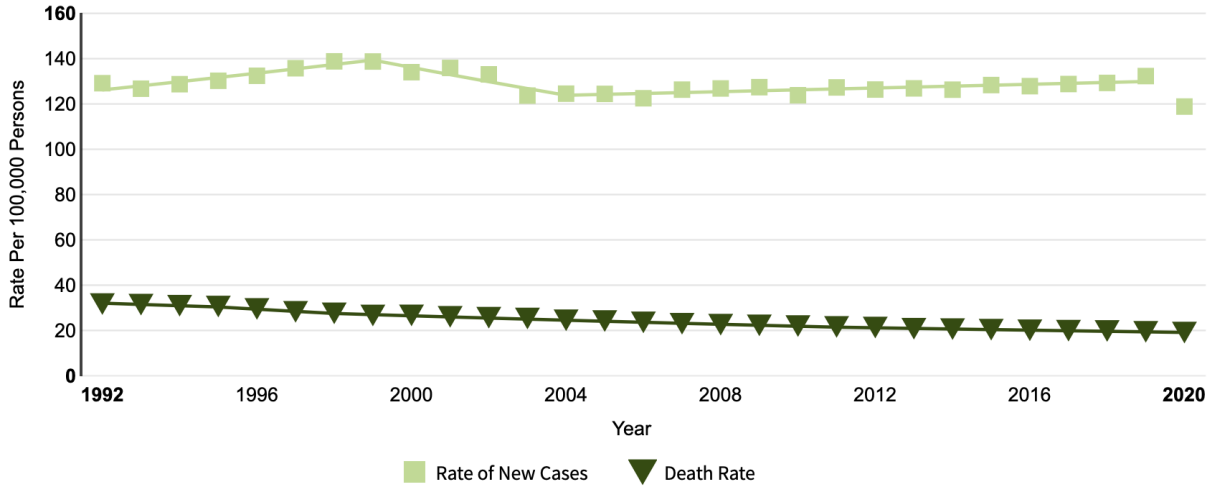
At a Glance

Estimated New Cases in 2023	297,790
% of All New Cancer Cases	15.2%
Estimated Deaths in 2023	43,170
% of All Cancer Deaths	7.1%

5-Year Relative Survival

90.8%

2013–2019



https://seer.cancer.gov/statfacts/html/breast.html

Therapy

- Surgery stop the metastasis (BCS, Mastectomy)
- Radiotherapy
- Chemotherapy
- Hormone therapy (Tumor back growth)
- Target therapy / precision medicine

Further Questions

- More Date --> Geolocalisation
- Combined gene aberrations and their impact of development of breast carcinoma
- Reoccurance rate after surgery / therapy